the service to the single individual. This is seen in the establishment of laboratories by boards of health in city and state in which the knowledge obtained by exact investigations can be made available in the service of the people; in the medical inspection of schools and factories; in the passing of laws directed against conditions which affect the public health; in the increased extension of hospitals. It must be remembered in connection with this that as a nation we are but following other nations, never leading, and our public health measures are far behind those of most of the European countries. Think how much is done by the medical profession as represented by the American Medical Association. As a profession medicine has never been one of the most lucrative, standing far behind the law in average income of its members; yet, it gives to the committee which has charge of public health, including public instructions, which we regard as an essential feature of this, $29,000 yearly, and there can be no selfish or ulterior motives behind the gift for the diminution in disease which we believe it furthers is not to the financial benefit of the members. It would be as though lawyers should devote a similar sum of money to the simplifying of the law and the creation of measures by which justice might be furthered. The idea of public service also underlies the creation of special laboratories and institutes in which through research greater knowledge of disease may be obtained and made available. Let us sum up the record of recent achievement; it is a proud one. Human life has been lengthened, many more individuals reaching the age of middle life. This has been due to the control of the infectious diseases which are the diseases of early life. With this has come an increase in the earning capacity of the race. For certain of infectious diseases there has been discovered a definite cure by the use of which the period of disease is shortened and the mortality reduced; for others, means have been found of increasing the resistance of the individual and infection is prevented, others are resisted by diminishing the opportunities for infection, this by the recognition and isolation of cases in the early stages of disease. The researches which have been made on the nutrition of man and the nutritive values of foods are of great importance and have not yet begun to be applied as they should be. It will undoubtedly be possible to realize a great economy in this regard. The greatest demonstration of what it is possible to achieve in the way of prevention of disease has been given in the building of the Panama Canal. In what had formerly with right been regarded as the most unhealthy region of the earth, great numbers of people from different regions, all unacclimated, that is, with no hereditary or acquired adaptation to the local conditions, have been assembled, have been engaged in the most arduous work and the mortality returns show as low a death rate as in the most favorable countries. The record which Col. Gorgas has established by the application of the laws of prevention of disease must remain one of the proudest achievements of man.

THE MEDICAL TREATMENT OF GALL-BLADDER DISEASE.*

By DUDLEY FULTON, M. D., Los Angeles.

Diseases of the biliary tract are somewhat peculiar, in that the same lesion in one individual may be latent and harmless, and in another intensely active and full of danger. With such variegated clinical manifestations and prognostic possibilities, one is shorn of the inclination to offer dogmatic rules of treatment. Individualization is necessary and therapeutic decision can be made only after careful consideration of all factors bearing upon each case.

One of the first things to consider in discussing the treatment of gall-bladder disease is what conditions are medical and in what sort of cases is surgery indicated. While opinions still vary on some points as to the indications for medical or for surgical treatment, it is rather unusual, we believe, for the internist and the surgeon to disagree when considering any given case. It is conceded that certain phases of gall-bladder disease are distinctly surgical, such as acute suppurative cholecystitis, frequently recurring gall-stone colic, empyema of the gall bladder, common duct obstruction, carcinoma, and the pancreatic lesions that are secondary to biliary infections. In certain mild cases—and these are the most frequent clinical types—chronic cholecystitis without stones, pericholecystitis and gall stones that are pursuing a latent course, it is debatable if medical treatment does not offer as much to the patient as surgery. Nowhere do we find wider dispute as to surgical indications than among surgeons, some advocating that there is no other treatment than operative; others, notably Kehr, consider eighty per cent. of gall-bladder diseases as medical.

We have referred a goodly number of patients with mild chronic cholecystitis to the surgeon the past few years, with rather disappointing results; although brilliant results were often obtained, failures have been frequent enough to teach us increasing conservatism in the selection of surgical cases. Not infrequently the post-operative history has been but little happier than in patients who declined operation and have since been carried along by medical treatment.

In diseases of the upper abdomen that have both a medical and surgical side, particularly chronic duodenal ulcer and chronic gall-bladder disease, the surgeon is wont to attribute non-cures to the complications of delay. While this is unquestionably true, the same may be said with double force by the internist. Were all cases diagnosed early, it is probable that medical treatment of gall-bladder disease would arrest the inflammation and prevent sequelae.

The greatest deficiency that exists in clinical medicine and surgery to-day is in diagnosis. Because of this deficiency, many of the cases of gall-bladder disease which now come to us present the end results of infection which began years

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ago when these conditions were not recognized as frequently as to-day.

There is always a tendency for end results of any treatment to be measured by percentage of mortality, rather than by percentage of cure. The removal of gall stones does not cure gall-bladder disease, unless conditions favoring stasis and infection,—the factors that made gall stones possible —are at the same time overcome. Other failures are due to neglect of post-operative medical treatment. It is ordinarily the custom, after the surgical treatment of nephrolithiasis, to institute treatment to correct those disturbances of metabolism that produce this condition by dietetic measures, free water drinking, and controlling the reaction of the urine, to prevent its recurrence. It seems to us that frequently the same care is not given to the post-operative management of gall-bladder disease.

Diseases of the gall-bladder are of remarkable frequency,—probably only a small percentage of those affected ever have active symptoms. In the Mayo clinic, eight per cent. of women operated for other conditions had gall stones. Many patients after a period of activity subside into latency indefinitely. This would make it appear that latent gall-bladder disease is not a very serious affair and that in such instances a legitimate choice may be offered between medical and surgical treatment. Nothnagle, evidently inclined to this view, once remarked that gall stones belong neither to the physician nor to the surgeon, but to the patient. But, in admitting the foregoing, no internist should forget the potential danger in gall-bladder disease and that needless delay in advising surgery converts such treatment from safety and simplicity to one of complications and inexcusable mortality. There is no better rule to guide the physician than to refer to the surgeon all cases in which the symptoms are persistent or are frequently recurring in spite of medical treatment, for surgery is undoubtedly the most effective treatment of the end results of bile duct infections. Unfortunately, many cases are not cured even by surgical treatment because of the impossibility of controlling adhesions and other gross pathological lesions. Like in chronic appendicitis, the damage is already done and can not be fully rectified.

It would therefore seem that there is a distinct medical side to the therapy of gall-bladder disease and that Kehr was probably not far from the truth when he stated that surgical treatment is indicated in only two types of cases. First, those with "vital" indications, chronic obstruction of the common bile duct, acute and chronic empyema, perforation, and carcinoma. Second, those with "relative" indications, all those cases in which long continued symptoms or frequent attacks of colic have robbed the patient of enjoyment of life, or have endangered his ability to earn a living.

In discussing medical treatment it should be made clear at the outset that the object should be, not the dissolution of stones or the removal of adhesions or the expulsion of concretions from the bile passages, for such attempts are futile. Indications point rather to the prevention and control of infection and stasis—the factors which make these gross lesions possible. These represent the end results of gall-bladder disease and when once formed all that can be expected of medical treatment is palliative. In the ability to reduce gall-bladder activity to latency, medical treatment accomplishes much, since this, as has already been pointed out, amounts practically to a cure in many cases.

Coming now to the prophylaxis and to the treatment of early gall-bladder disease, we find that these phases of the subject are purely medical. In the prevention of the involvement of the biliary tract in acute infections, no extended work from bacteriological standpoint has, so fas as we know, been done. Some clinicians have directed attention to typhoid and colon bacillus infections of the gall-bladder, hoping thereby to prevent or cure the incipient infection of the mucosa before this becomes extensive enough to obstruct the cystic duct, formation of calculi, or the involvement of tissues beyond the mucosa. Engelbach, in his study of this phase of the question, emphasizes the frequency of cholecystitis during the course of typhoid fever and believes that this local infection of the gall-bladder is probably the most frequent cause that prolongs the disease more than three weeks and that otherwise modifies the clinical course of the disease. He cites a series of fourteen cases in which the usual signs of rigidity and tenderness in the gall-bladder region were present, and in which gall-bladder antiseptics and vaccines were used in cases which failed to terminate by lysis the third week. No attempt was made to draw any further lesson from his limited number of cases than a suggestion to stimulate similar work.

Biliary Antiseptics—Crowe's studies determined that hexamethylenamin, when administered in sufficiently large doses (at least seventy-five grains a day) appeared in the gall-bladder in a concentration sufficient to render bile an unsuitable media for the growth of bacteria. In some of the cases, in which the infecting organism was B. typhosus, it was possible to render the interior of the gall-bladder sterile so long as active therapy was continued. Quite recently Burnham has failed to corroborate Crowe's findings and doubts the value of the drug in biliary infections.

Of the numerous drugs employed as biliary antiseptics, we know of none that can be given in sufficient dosage to reach the gall-bladder in a concentration sufficient to be clinically effective. The medical treatment of infections of the biliary passages must be attempted by other measures. Whether or not immunizing serum will prove competent in keeping the bile passages sterile in acute general infections remains for the future to determine.

The extended use of proprietary gall-bladder remedies by the profession is a matter of regret and it is unfortunate that the medical treatment of gall-bladder disease is so frequently limited to the use of such nostrums. Members of the pro-

fession who prescribe such—the composition and pharmaceutical action of which they know nothing, except the gilded promises of the manufacturer—exhibit quite the same gullibility as do those weak members of the laity who, with more faith than reason, become converts to various forms of charlatanism.

Chologen, a representative of this class of gall-stone "cures" and which has been before the medical public the past few years, consists of three kinds of tablets: No. 1, calomel and padophyllin; No. 2, calomel, and No. 3, calomel padophyllin, camphor and menthol, none of which so far as is known have any specific action upon diseases of the biliary apparatus.

Bile Stasis—Naunyn, after a lifelong study of this subject, has recently called attention to the presence of micro-organisms, particularly, the Bacterium Coli, in the duodenal portion of the common duct of healthy individuals. Naunyn calls this "normal bacterichолia." So long as the stream of bile suffers no obstruction to its passage, this organism remains harmless. Whenever stagnation occurs for a while, a dangerous accumulation of bacilli occurs and this leads to bacterial infection of the bile. It is not necessary that the bile stream should be completely interrupted; any degree of stagnation may be sufficient. Mayer also suggests the importance of stasis by the assertion that gall-stones usually produce no symptoms so long as there is normal flow of bile. The importance of the prevention of bile stasis becomes therefore an indication of importance and it would appear that medical treatment has one of its best weapons in the ability to favorably influence bile flow in gall-bladder diseases.

Of exceptional importance and influence upon the flow of bile is the action of the choledocho-duodenal sphincter, that powerful constricting muscle in the pars intestinalis of the ductus choledochus. Thanks chiefly to the work of Pawlow; this sphincter is known to open only at definite times, chiefly during digestion; when closed it opposes a powerful obstruction to the bile so that the latter is forced to flow toward the place of less resistance—through the cystic duct into the gall-bladder. At the beginning of digestion, as soon as the sphincter is opened, the thickened bile from the gall-bladder mixes with the bile secreted by the liver and reaches the duodenum. Since in gall-bladder disease, the bile stagnates in the gall-bladder more than under normal conditions, it becomes more viscid and thick and is, therefore, hindered in its outflow during the periodic opening of the sphincter. One of the most important indications for medical treatment is, therefore, to promote its expulsion into the intestine.

Nothnagle years since made the assertion, based upon wide experience, that a full meal is the best cholagog. The explanation of the function of the choledocho-duodenal sphincter justifies Nothnagle's clinical observation. The periodic opening of this sphincter is essential to the entry of bile into the intestine. The more frequently the tone of this muscle relaxes, the more the outflow of bile is rendered possible. When the stomach is empty, or after it has discharged its contents completely, the outflow of bile into the intestines ceases. On this account in gall-bladder disease, it is advisable to allow as short pauses as possible in the passage of food into the duodenum. In other words, patients should be given food as often as possible. A heavy meal undoubtedly stimulates bile production more powerfully than smaller meals. Increased flow of bile, however, is the object of treatment rather than increased production of bile. Mayer, writing on this subject, recently stated that the ordering of frequent but small meals forms the first principal in the dietic treatment of gall-bladder disease. The diet should be divided into at least five meals daily. All foods difficult of digestion and easily decomposed and lead to fermentation, should be strictly forbidden, and in all individual cases the diet must be adapted to the existing conditions of the stomach and intestines. This summarizes the whole question of the dietetic treatment. There is no special gall-bladder diet.

Other measures that promote the expulsion of bile from the gall-bladder and thus lessen stasis are the maintenance of normal intestinal peristalsis, the action of the abdominal walls and the pressure of the diaphragm upon the liver during inspiration, and exercise. The powerful influence of intestinal peristalsis which is communicated to the muscular apparatus of the biliary tract is suggested by the not infrequent occurrence of gall-stone colic following excessive purgation. It is important, therefore, to insure regular and normal intestinal peristalsis by dietetic measures and the use of mild laxatives. To its favorable influence upon intestinal peristalsis and to the removal of injurious products of digestion, combined with the dilution effect of free water drinking, is to be attributed the benefits obtained by the Carlsbad and similar treatments.

Those factors which exert an influence upon the respiratory action of the diaphragm and through it on the outflow of bile, such as deep breathing, physical exercise and the prohibition of badly fitting corsets, are of the greatest importance.

Cholagogs—The cholagog principle of gall-bladder disease is one of the oldest efforts of treatment. Numerous agents have been used with the idea to increase the amount of bile. Were it possible by medical measures to increase the secretory functions of the liver, it is questionable if the resulting increase in the amount of bile would prove beneficial. In certain complications, such as chronic obstruction of the common duct, this would be positively dangerous. The point is usually overlooked that it is not that bile is formed in insufficient amount, but that the bile which is formed, stagnates, and it is to the latter that treatment should be directed. Furthermore, in view of the action of the common duct sphincter, it is doubtful whether cholagog agents could, by the formation of increased amount of bile, sufficiently raise the pressure in the bile passages to overcome the resistance of the sphincter. This normally opposes a resistance corresponding to a pressure of about 700 m.m. of water, while the normal secretion pressure is equal only to about 200 m. m. of

water. It seems, therefore, that the use of cholagog agents even if effective would be irrational. It is, however, possible to produce a more easy outflow of bile into the intestine if we make the bile more fluid. The most effective means we have of accomplishing this is by drinking an abundance of water, especially upon an empty stomach. It should be taken as hot as possible, for cold liquids, especially in cholelithiasis, frequently induce attacks of colic, and because of the beneficial relaxing effect that heat exerts upon muscle spasm. Patients should drink one or two tumblers of hot water an hour before breakfast and a tumbler or two in the evening before retiring, and in small quantities frequently during the day.

While the control of stasis and infection are the logically defined indications in medical treatment according to the present limit of knowledge, it is probably far from the truth to conclude that they will ultimately be the only ones. Cholesterin metabolism, of which but little is definitely known; the influence of disturbances of the liver and of general metabolism upon fluctuations in the composition of bile; the various factors that control the excretion of bile, and the problems attending infections of the gall-bladder and immunity in acute infectious diseases are additional factors which, when worked out and put upon a clinical basis, may have a marked and perchance a revolutionary influence upon our conception of treatment.

Finally it should be said that perhaps in no other abdominal condition is complete rest more indicated than following acute manifestations of gall-bladder disease. Following acute cholecystitis and even after gall-stone colic, it is well to keep the patient in bed for several days after each attack, and after all inflammatory manifestations have passed off, and until no tenderness on pressure over the gall-bladder remains, a period which may extend from days to weeks, according to the severity of the case. By more careful insistence upon rest, chronicity of the disease may frequently be avoided.

THE TREATMENT OF TUBERCULOSIS WITH A SOLUBLE VACCINE—A PRELIMINARY REPORT.

By J. O. HIRSCHFELDER, M. D.

In the Journal of the American Medical Association of October 12, 1912, and April 5, 1913, a method of treatment of pneumococcus and of gonococcus infections with extracts of these microorganisms was described. Since these publications a comparatively large number of cases have been treated with equally favorable results. In addition similar favorable observations have been made with pancreatic extracts of the diplostreptococcus of Poynton and Payne and the viridans in acute endocarditis and in rheumatism. In staphylococcus infection similar results have been reported from the use of a pancreatic extract of that germ.

For about a year and a half experiments have been conducted in the hope of obtaining an extract of the endobody of the bacillus tuberculosis. Such a substance was derived from the digestion of the bacillus with pepsine. The living bacillus was treated with acidulated pepsine at 38 degrees, the action of the ferment stopped with alkalie, and the solution filtered through a Pasteur filter. It was found that pancreatine did not work quite as satisfactorily.

The extract was repeatedly standardized upon tubercular guinea pigs, and after an absolutely reliable preparation had been made and the method perfected so that the dosage could be accurately determined, a number of cases of tuberculosis were treated. The results have been very encouraging, but the number of cases has been too small and the duration of the observation too short to permit more than this provisional announcement of the method for the present. In none of the cases treated were any unfavorable effects noted. Rapid improvement has been observed both subjectively and objectively, the X-ray plate showing the clearing up of the tubercular deposits in the lungs. Several cases with tubercular laryngeal ulcers have been observed, and in all of them rapid healing of the ulcers has been noted by the laryngologist. Bone tuberculosis of years' standing has been seen to improve, and the progress has been recorded by the radiograph.

275 Post St.

MEDICAL ENDOWMENT FOR THE UNIVERSITY OF CALIFORNIA.

President Wheeler announced at Commencement Day, May 14, 1913, the George Williams Hooper Medical endowment for Medical Research. This is the greatest single, private gift ever made in California for the service of mankind. The gift is from Mrs. George Williams Hooper in memory of her husband. It consists of a foundation for medical research in connection with the University of California, and under the charge and ownership of the Regents of the University. The gift is in the form of property worth considerably more than $1,000,000, and will yield an income of $50,000 a year at present. None of the income is to be used for building purposes.

The institution will have an advisory board. In this board will be Mr. Pritchitt, President of the Carnegie Foundation; Wm. H. Welch, Professor of Pathology in the Johns Hopkins Medical School; Benjamin Ide Wheeler, President of the University of California; Dr. H. C. Moffitt, Dean of the University of California Medical School; Mr. E. H. Connelly, representing the interests of Mrs. Hooper, and two other persons to be chosen.

Announcement was also made of gifts aggregating $479,250 for a new hospital for the University of California Medical School. Work will begin on this building as soon as $600,000 is raised. As soon as the hospital is finished, the teaching departments of the first two years, which are now located in Berkeley, will be moved to San Francisco, thus bringing all the medical teaching to that city.

WALLACE I. TERRY, Acting Dean.